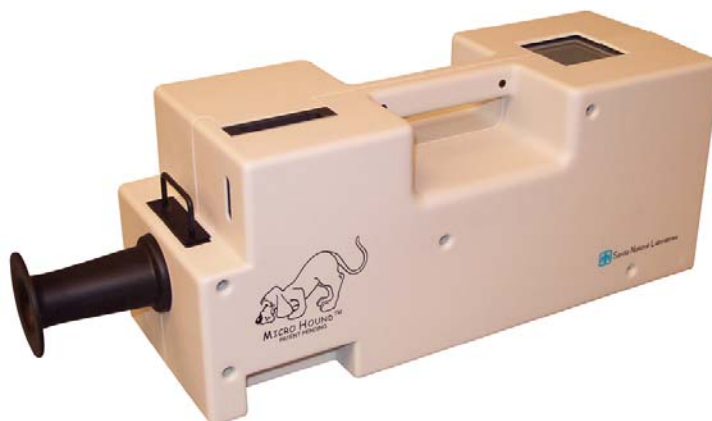


# The MicroHound™:

## Microsensor-Based Explosives Detection



The MicroHound provides a fast, portable, lightweight, low-cost solution for trace detection of common high explosives.

### *Capabilities*

Sandia National Laboratories has developed the MicroHound™, a fast, handheld system for the trace detection of explosives. This lightweight (about 12 pounds) system can detect both explosives vapor and particulate. The development of the MicroHound™ was a quest to combine, in a single platform, a miniaturized sampling and preconcentration system with multiple, highly sensitive chemical microsensors that can detect nanogram amounts of explosives. The long-term goals of the project are to reduce the size, weight, and cost of a portable trace explosives detection system and use a multi-sensor platform to improve functionality. The sampling and preconcentration technology used in the MicroHound™ was originally developed and patented by Sandia for a personnel explosives detection portal. Ultimately, commercial versions of the MicroHound will be produced at a comparatively low cost (about \$5K to \$10K per mass-produced unit vs. \$20K to \$30K for current commercial handheld systems).

### *Features*

- Trace explosives detection for common high explosives—detects sub-fingerprint quantities of explosive residue
- Hand-portable
- Integrated sampling, preconcentration, and detection subsystems into a single system package
- Multi-microsensor capabilities
- Multi-stage preconcentration

(over)

## Operation

The MicroHound™ can operate in two modes:

- contactless vapor mode, which “sniffs” the air surrounding a suspicious item, or
- swipe mode, which removes particulate from the surface of a suspicious item.

In vapor mode, the sampling unit draws in a large volume of air and collects heavy organic compounds from the air stream onto a filter. In swipe mode, the operator swipes a suspicious object's surface and places the filter in a holder. For both modes, the system then vaporizes these compounds into a concentrated sample that is delivered to an ion mobility spectrometer (IMS) detector. If explosives are found, the unit displays an alarm to the operator.

## Applications

The MicroHound™ is designed for use by the responder community to examine suspicious packages or as a tool for screening at checkpoints. A low-cost, light, effective tool would enable its use in more areas, such as courtrooms and schools, as well as in high-security, high-risk facilities and locations.



**This photo demonstrates how the MicroHound could be used to detect explosives in vapor mode in a section of an airplane.**

## Availability

The MicroHound is currently in the engineering prototype stage and is undergoing field evaluations and continuing development of advanced capabilities. Sandia will be exploring commercialization opportunities for this technology.



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